

Project 5557.2

Nano grain thick-film pastes for mechanical Sensor applications

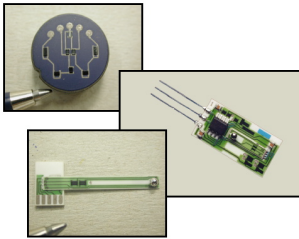
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Industry partners: Sensile Technologies, Lausanne and Huba Control, Würenlos

Project aim : optimised piezoresistive thick-film compositions, especially for low-temperature applications on Aluminum alloys, Titanium alloys, steel and glass

Examples of force and pressure sensors



Desirable properties for Thick-Film Resistors (TFR):

- high gauge factor (piezoresistive effect)
- high strain to failure
- high thermal stability
- low noise
- low temperature dependence
- low sensitivity to firing conditions (large process window)
- low temperature firing

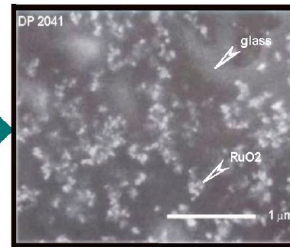
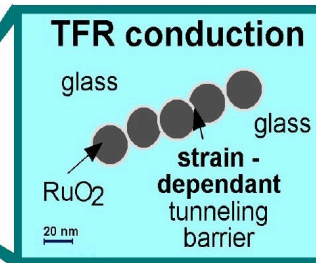
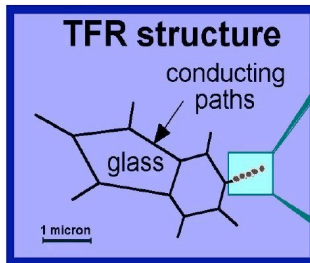
To control the properties



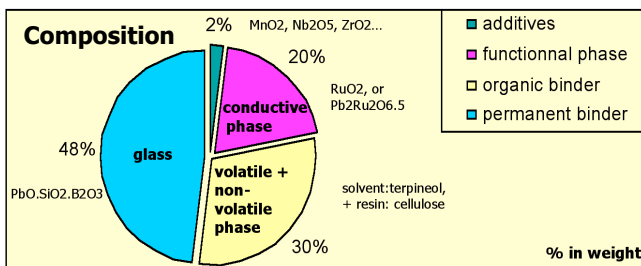
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to understand the phenomena, occurring during the firing process

Relation between the nano-structure and the electrical response

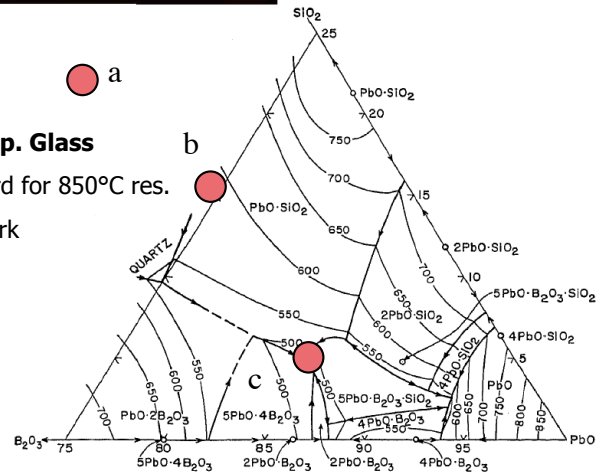


Surface observation by SEM of a piezoresistive paste fired at 850°C during 10 min (standard conditions)

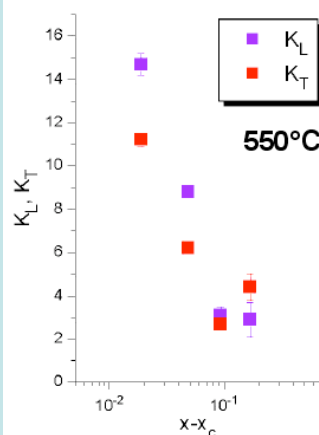
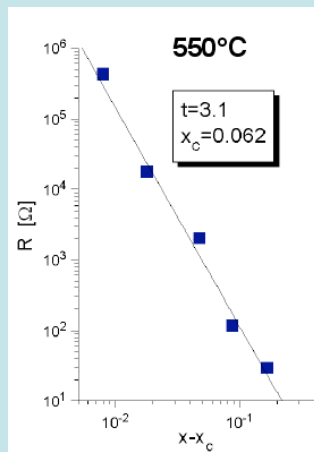


Low-temp. Glass

- a) standard for 850°C res.
- b) this work
- c) future



Properties : resistance and gauge factors



Th. Maeder, 8.9.2003

Demonstrator on aluminium substrate

